

PATENT ABSTRACTS OF JAPAN

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(54) MONITOR CONTROLLER

(57)Abstract:

PROBLEM TO BE SOLVED: To revise configuration information of a monitored controller by allowing a monitor controller to recognize it when the configuration of a group of monitored controllers is revised.

SOLUTION: An equipment type identifier use field is provided in a data packet sent by a monitored controller An to a monitor controller 1. In the case of receiving a packet with an address having not been recognized for the monitored controller An, when the address is not used before, the monitor controller 1 allows a user to select a symbol denoting a state of a device connected newly as to which monitor menu 15 the symbol is to be added and allows the user to select the data of the new device. When the address is used before but the kind of device differs from that before, the controller 1 allows the user to confirm the device change, deletes the data of the preceding device and adds the data of the new device. When the configuration of the monitored controller An is revised,

the monitor controller 1 recognizes it automatically to revise a database.

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## CLAIMS

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[Claim(s)]

[Claim 1] With the communications department which polls to the monitor and control equipment-ed which has a means to transmit a data packet including the field for the device identification children of all the addresses The supervisory-control-ed equipment configuration storage section which memorizes the equipment class corresponding to the supervisory-control-ed device address and its address, The screen information storage section which memorizes the equipment symbol information and screen information of a monitor screen, The equipment link condition decision section which monitors continuously whether there is any response to polling from the monitor and control equipment-ed of the address which is not connected now, or there is nothing, Monitor and control equipment characterized by having the processing section which recognizes automatically the case where the configuration of a supervisory equipment-ed group is changed by comparing with the data of said supervisory-control-ed equipment configuration storage section the address and the equipment class identifier which were received from said equipment link condition decision section, and changes a database.

[Claim 2] When the address is not before used as compared with the data of said supervisory-control-ed equipment configuration storage section, said processing section the address and the equipment class identifier which were received from the equipment link condition decision section When it is judged as "new equipment augmentation", the address is used before and an equipment class differs from before It is judged as "equipment modification" and the address is used before. When an equipment class is the same as before A supervisory-control-ed equipment augmentation decision means to judge "with no equipment modification", and in the case of "new equipment augmentation" The screen as which it is made to choose it to which monitor screen the equipment symbol which shows the monitor and control equipment-ed connected newly is added is displayed. The equipment symbol data applicable to the monitor and control equipment-ed [ new ] are added to said screen information storage section after an employment person's choosing, and monitor station-ed equipment configuration data are changed. In "equipment modification" Display the screen of an equipment modification check and the equipment symbol data corresponding to the former monitor and control equipment-ed are deleted from said screen information storage section after a check of an employment person. then, with [ the same processing as the case of the above "new equipment augmentation" is performed, and ] no "equipment modification --" -- the monitor and control equipment according to claim 1 further characterized by having in a case the supervisory-control-ed equipment configuration data modification means which nothing performs.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Industrial Application] Especially this invention relates to the monitor and control equipment which carries out supervisory control of two or more monitor and control equipment-ed which has the address of a proper respectively about the monitor and control equipment.

[0002]

[Description of the Prior Art] The monitor and control equipment which carries out supervisory control of two or more monitor and control equipment-ed which has the address of a proper respectively conventionally has the database which memorizes the address of the monitor and control equipment-ed, and matching of an equipment class,

and supervisory control processing according to the contents is performed.

[0003] When the configuration of the monitor and control equipment-ed changed, the database of the supervisory control-ed equipment configuration on the monitor and control equipment was changed by the manual (when the monitor and control equipment-ed is added newly etc.).

[0004] In order to solve this kind of problem, in the network configuration managerial system indicated by JP,5-199244,A Send out a polling command periodically to a network device, and a connection condition and a communication link condition are supervised. The communication link address collected when it judged with the network device newly having been added, and its connection condition moreover, when it judges with the network device having been removed It sends out to the network administration section by making that into change-of-state information, and the approach the network administration section updates network connection information based on the change-of-state information is proposed.

[0005]

[Problem(s) to be Solved by the Invention] However, in the network configuration managerial system indicated by above-mentioned JP,5-199244,A, since network connection information is updated only based on connection of a network device and removal information, when the network devices for a monitor are two or more classes, there is a fault that it cannot respond.

[0006] This invention is made in order to cancel the above-mentioned fault which is inherent in a Prior art in view of the conventional above-mentioned actual condition, therefore the purpose of this invention has a monitor-and-control-equipment side in offering the new monitor and control equipment which made it possible to recognize automatically and to change the database of a supervisory control-ed equipment configuration, when the configuration of the monitor-and-control-equipment-ed group which consisted of monitor and control equipment-ed of two or more classes is changed.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the monitor and control equipment concerning this invention is constituted as shown below.

[0008] The monitor and control equipment which supervises the monitor and control equipment-ed of a maximum N individual as shown in drawing 3 now is considered. The monitor and control equipment-ed has a means to transmit a data packet including the field for device identification children to the monitor and control equipment, when the polling to the self-address is received.

[0009] The monitor and control equipment has the screen-display section, a control unit,

the communications department, the supervisory-controlled equipment configuration storage section, the screen information storage section, the transceiver section, the equipment link condition decision section, and the processing section.

[0010] The transmitting section polls to the controlled supervisory equipment of all the addresses, and outputs the response data from the monitor and control equipment-ed to the processing section.

[0011] The supervisory-controlled equipment configuration storage section memorizes the equipment class corresponding to the supervisory-controlled device address and its address.

[0012] The screen information storage section memorizes the equipment symbol information and screen information of a monitor screen which are displayed on a display.

[0013] If the equipment link condition decision section is monitoring continuously whether there is any response to polling from the supervisory equipment-ed of the address which is not connected now, or there is nothing and it is discovered, it will tell the address and the equipment class identifier of the supervisory equipment-ed to the processing section.

[0014] The processing section has a supervisory-controlled equipment augmentation decision means and a supervisory-controlled equipment configuration data modification means.

[0015] A supervisory-controlled equipment augmentation decision means compares with the data of the supervisory-controlled equipment configuration storage section the address and the equipment class identifier which were received from the equipment link condition decision section. When the address is not used before It is judged as "new equipment augmentation", and when the address is used before and an equipment class differs from before, it is judged as "equipment modification", the address is used before, and when an equipment class is the same as before, "with no equipment modification" is judged.

[0016] In the case of "new equipment augmentation", a supervisory-controlled equipment configuration data modification means displays the screen as which it is made to choose it to which monitor screen the equipment symbol which shows the monitor and control equipment-ed connected newly is added, adds the equipment symbol data which correspond to the monitor and control equipment-ed [ new ] after an employment person's choosing to the screen information storage section, and changes monitor station-ed equipment configuration data.

[0017] The screen of an equipment modification check is displayed, after a check of an employment person, in "equipment modification", the equipment symbol data

corresponding to the former monitor and control equipment-ed are deleted from the screen information storage section, and the same processing as the case of "new equipment augmentation" is carried out to it after that.

[0018]

[Function] When the configuration of a supervisory-control-ed station is changed by having constituted as mentioned above and the monitor and control equipment-ed is newly added to the address which was not used before, this invention The equipment link condition decision section tells the equipment class of the address and monitor and control equipment-ed to the processing section, the supervisory-control-ed addition decision means of the processing section is judged to be "new equipment augmentation", and the screen which chooses the monitor screen to which an employment person adds an equipment symbol is displayed automatically.

[0019] When an employment person chooses the monitor screen to which an equipment symbol is added, the screen symbol corresponding to the monitor and control equipment-ed is added, and supervisory-control-ed configuration data are updated.

[0020] Moreover, when the monitor and control equipment-ed of a different equipment class from before is added to the address currently used before, the supervisory-control-ed addition means of the processing section judges to be "equipment modification", the screen to which the check of "equipment modification" by the employment person urges is displayed automatically, and the screen which chooses in the monitor screen to which an employment person adds an equipment symbol after a check of an employment person is displayed automatically.

[0021] When an employment person chooses the monitor screen to which an equipment symbol is added, the screen symbol corresponding to the monitor and control equipment-ed is added, and supervisory-control-ed equipment configuration data are updated.

[0022]

[Example] Next, this invention is concretely explained with reference to a drawing about the one desirable example.

[0023] Drawing 1 is the block block diagram showing one example of the monitor and control equipment concerning this invention.

[0024] With reference to drawing 1, the monitor and control equipment  $A_i$  ( $i = 1 \cdot N$ )-ed of a maximum  $N$  individual is connected to the monitor and control equipment 1. The monitor and control equipment 1 consists of the screen-display section 15, a control unit 16, the communications department 14, the supervisory-control-ed equipment configuration storage section 12, the screen information storage section 11, the

equipment link condition decision section 17, and the processing section 13.

[0025] The screen-display section 15 is for being able to display an alphabetic character and GURAFIKU information, displaying the condition of the monitor and control equipment Ai-ed, or displaying an employment person's input screen.

[0026] As for a control unit 16, an employment person operates a key input etc.

[0027] The data with the fields, such as address information and an equipment class as shown in drawing 3 , and a screen symbol number, of a tabular format are stored in the supervisory-control-ed equipment configuration storage section 12. When there is no monitor and control equipment-ed corresponding to the address, the value of the field of an equipment class is defined as "Un-connecting."

[0028] The data with the fields, such as an equipment symbol number as shown in drawing 4 , a monitor screen number, and coordinate information, of a tabular format are stored in the screen information storage section 11.

[0029] The communications department 14 performs sequential polling to the monitor and control equipment Ai-ed.

[0030] The monitor and control equipment Ai-ed transmits a data packet ( drawing 2 ) including the field for device identification children to the monitor and control equipment 1, when the polling to the self-address is received.

[0031] If the equipment link condition decision section 17 is monitoring continuously whether there is any response to polling from the monitor and control equipment-ed of the address which is not connected now, or there is nothing and it is discovered, it will tell the address and the equipment class identifier of the monitor and control equipment-ed to the processing section 13.

[0032] Here, the case where the monitor and control equipment-ed is not connected to the address 3 before (the equipment class field value of the record of the address 3 of the supervisory-control-ed equipment configuration storage section 12 is the condition of "not connecting"), and the monitor and control equipment-ed is newly connected to the address 3 is considered.

[0033] Since the communications department 14 is performing sequential polling to all the supervisory-control-ed stations Ai, the monitor and control equipment-ed newly connected to the address 3 receives the polling to the address 3, and it returns a response to the monitor and control equipment 1. The equipment link condition decision section 17 of the monitor and control equipment 1 detects that the response from the monitor and control equipment-ed of the address 3 returned, and tells the address and an equipment class to the processing section 13. The processing section 13 reads the value of the equipment class field of the record of the address 3 of the

supervisory-controlled equipment configuration storage section 12 from the address information received from the equipment link condition decision section 17.

[0034] Since "it has not connected", the processing section 13 judges the equipment field value of the record of the address 3 to be "new equipment augmentation." The screen as which it is made to choose it to which monitor screen the equipment symbol which shows the monitor and control equipment-ed connected newly is added is displayed, the equipment symbol data which correspond to the monitor and control equipment-ed [ new ] at the screen information storage section 11 are added after an employment person's choosing, and the equipment class and symbol number of a record of the supervisory-controlled equipment configuration storage section 12 are changed. [ of the address 3 ]

[0035] Next, the case where the monitor and control equipment-ed of the equipment class A is connected to the address 1 before (the equipment class field value of the record of the address 1 of the supervisory-controlled equipment configuration storage section 12 is the condition of "the equipment class A"), and the monitor and control equipment-ed of the equipment class C is newly connected to the address 1 is considered.

[0036] Since the communications department 14 is performing sequential polling to all the supervisory-controlled stations Ai, the monitor and control equipment-ed of the address 1 receives the polling to the address 1, and it returns a response to the monitor and control equipment 1. The equipment link condition decision section 17 of the monitor and control equipment 1 detects that the response from the monitor and control equipment-ed of the address 1 returned, and tells the address and an equipment class to the processing section 13. The processing section 13 reads the value of the equipment class field of the record of the address 1 of the supervisory-controlled equipment configuration storage section 12 from the address information received from the equipment link condition decision section 17. Since the equipment field value of the record of the address 1 differs from the value "the equipment class C" of the \*\*\*\* monitor and control equipment which is "the equipment class A" and received from the equipment link condition decision section 17, the processing section 13 judges it to be "equipment modification."

[0037] The processing section 13 displays the screen of an equipment modification check. After a check of an employment person, The equipment symbol data corresponding to the former monitor and control equipment-ed are deleted from the screen information storage section 11 (the record of the screen information storage section 11 to which the symbol number field of the record of the address 1 of the supervisory-controlled equipment configuration storage section 12 points is deleted). After that, The screen as



which it is made to choose it to which monitor screen the equipment symbol which shows the monitor and control equipment-ed connected newly is added is displayed. The equipment symbol data applicable to the monitor and control equipment-ed [ new ] are added to the screen information storage section 11 after an employment person's choosing, and the equipment class and symbol number of a record of the supervisory-control-ed equipment configuration storage section 12 are changed. [ of the address 1 ]

[0038] Next, the case where the monitor and control equipment-ed of the equipment class B is connected to the address 2 before (the equipment class field value of the record of the address 2 of the supervisory-control-ed equipment configuration storage section 12 is the condition of "the equipment class B"), and the monitor and control equipment-ed of the equipment class B is newly connected to the address 2 is considered.

[0039] Since the communications department 14 is performing sequential polling to all supervisory-control-ed stations, the monitor and control equipment-ed of the address 1 receives the polling to the address 2, and it returns a response to the monitor and control equipment 1. The equipment link condition decision section 17 of the monitor and control equipment 1 detects that the response from the monitor and control equipment-ed of the address 2 returned, and tells the address and an equipment class to the processing section 13. The processing section 13 reads the value of the equipment class field of the record of the address 2 of the supervisory-control-ed equipment configuration storage section 12 from the address information received from the equipment link condition decision section 17. Since the equipment field value of the record of the address 2 is equal to the value "the equipment class B" of the \*\*\*\* monitor and control equipment which is "the equipment class B" and received from the equipment link condition decision section 17, the processing section 13 judges "with no equipment modification", and processes nothing.

[0040]

[Effect of the Invention] As explained above, when according to this invention the configuration of a supervisory-control-ed station is changed and the monitor and control equipment-ed is newly added to the address which was not used before By displaying automatically the screen which chooses the monitor screen to which an employment person adds an equipment symbol, and choosing the monitor screen to which an employment person adds an equipment symbol, the screen symbol corresponding to the monitor and control equipment-ed is added, and supervisory-control-ed equipment configuration data are updated.

[0041] Moreover, when the monitor and control equipment-ed of a different equipment

class from before is added to the address currently used before, the screen to which the check of equipment modification by the employment person is urged is displayed automatically, and the screen which chooses the monitor screen to which an employment person adds an equipment symbol is automatically displayed after a check of an employment person. When an employment person chooses the monitor screen to which an equipment symbol is added, the screen symbol corresponding to the monitor and control equipment-ed is added, and supervisory-control-ed equipment configuration data are updated.

[0042] By this, the renewal of semi-automatic of supervisory-control-ed equipment configuration data when the configuration of a supervisory-control-ed station is changed is attained, and the effectiveness that improvement in an employment person's operability can be aimed at is acquired.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the block block diagram showing one example of the monitor and control equipment concerning this invention.

[Drawing 2] It is drawing showing an example of the data packet used for this invention.

[Drawing 3] It is drawing showing an example of the supervisory-control-ed equipment configuration database used in this invention.

[Drawing 4] It is drawing showing an example of the screen symbol information database used for this invention.

[Description of Notations]

1 -- Monitor and control equipment

11 -- Screen information storage section

12 -- Supervisory-control-ed equipment configuration storage section

13 -- Processing section

14 -- Communications department

15 -- Screen-display section

16 -- Control unit

17 -- Equipment link condition decision section

Ai (A1 ..... AN) -- Monitor and control equipment-ed